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conica. The results are different from those of IKENO in regard to the blepharoplast and centrosome. He finds no centrosome in the mitoses preceding the mother cell of the spermatid, and believes that his failure to find one is due to the absence of such a structure and not to any defect in technique. Two blepharoplasts were observed first in the mother cell of the spermatid near the plasma membrane, far from the nucleus. ESCOYEZ does not consider the blepharoplast to be a true centrosome; yet he has not traced its origin, and whether it comes from within the nucleus or from a certain region of the cytoplasm is not settled.—S. YAMANOUCHI.

Sorus of Dipteris.—MISS ARMOUR⁴⁰ has studied material of *Dipteris* that included the younger stages of the sporangium. *D. bifurcata* showed simultaneous development of sporangia in the sorus, and *D. conjugata* sporangia of different ages. The former, therefore, conforms to BOWER's "Simplices," and the latter to his "Mixtae." The three species seem to make a series in the form of the leaf, with *D. bifurcata* as the most primitive, and *D. quinquefurcata* in an intermediate position; parallel with this is the division of sori, leading to increase in their number and decrease in the number of sporangia in a sorus; and finally there is the progression from the "Simplices" type to the "Mixtae" type. This series is thought to have progressed from such a type as *Matonia*.—J. M. C.

Morphology of Symplocarpus.—ROSENDAHL has investigated the embryo sac and embryo of *Symplocarpus*, and an abstract of his results has been published.⁴¹ The primordia of the flowers appear eighteen to twenty months before anthesis, the ovules being "formed" in the season (autumn) preceding pollination. The proembryo is of the massive type characteristic of the aroids, in this case becoming ovoid in form. There is a short suspensor, and the stem tip is organized in a groove of the proembryo which develops near the suspensor. The endosperm encroaches upon both integuments and even into the chalazal tissue; and in turn the massive proembryo ("protocorm") destroys the endosperm, so that finally the embryo is freely exposed in the cavity of the ovary.—J. M. C.

Proteases.—VINES, in his fifth paper on this subject,⁴² reports that oily seeds, those of hemp in particular, contain proteolytic enzymes which act vigorously without restraint from the oil present. He succeeded in isolating, for the first time from plant tissues, "a protease that is essentially peptic in its properties, digesting fibrin to albumose or peptone, but not acting on albumose or peptone, whether produced by its own digestion of fibrin or added as Witte-peptone. The facts justify the conclusion that the hemp seed contains two proteases, the one a

⁴⁰ ARMOUR, HELEN M., On the sorus of *Dipteris*. *New Phytologist* **6**:238-244. *figs. 11-14*. 1907.

⁴¹ ROSENDAHL, C. O., Embryo sac development and embryology of *Symplocarpus joetidus*. *Science*, N. S. **27**:209. 1908.

⁴² VINES, S. H., The proteases of plants. V. *Annals of Botany* **22**:103-113. 1908.

peptase, the other an ereptase. He hopes soon to arrive at a general conclusion as to the nature of "vegetable trypsin," which by his admirable researches so far seems resolvable into a peptase and an ereptase.—C. R. B.

Structure of chloroplasts.—This has long been in doubt, the current doctrine being that the ordinary chloroplast consists of a stony stroma in whose meshes the chlorophyll is held as a green fluid. PRIESTLEY and IRVING show⁴³ that in the large chloroplasts of *Chlorophytum elatum*, *Selaginella Kraussiana*, and *S. Martensii* the chlorophyll is restricted to a peripheral zone, probably less than 1μ thick, where it is held in the meshes of a spongy stroma. This agrees with the arrangement theoretically best according to TIMIRIAZEFF. The authors also confirm the neglected observations of NÄGELI and TIMIRIAZEFF on the splitting of the chloroplasts in solutions of low osmotic pressure.—C. R. B.

Morphology of wheat.—ARTHUR H. DUDLEY,⁴⁴ in a presidential address before the Liverpool Microscopical Society, presented an account of floral development, sporogenesis, and embryogeny in wheat. A summary of his results is as follows: the archesporium of the microsporangium is a single row of cells, two or three divisions occurring before the mother-cell stage is reached; the archesporial cell of the megasporangium does not cut off a parietal cell, but produces directly the linear tetrad, the reduction number of chromosomes being eight; a large development of antipodal tissue occurs; and the embryo is said to be derived from the "apical cell only" of the proembryo.—J. M. C.

Scion and stock.—GUIGNARD has made another attempt to settle the question whether compounds peculiar to either scion or stock are able to migrate past the point of grafting.⁴⁵ When a plant which contains an HCN-glucoside is grafted on a plant which contains none, or conversely (GUIGNARD used *Phaseolus lunatus*, *Photinia serrulata*, and five species of *Cotoneaster*), there is no transfer of this glucoside in either direction. This adds one more bit to the negative evidence that is accumulating against the uncertain positive claims of such migration. The paper contains a good history of the question.—C. R. B.

Tolerance for salts.—Continuing their work on the relation between alkali soils and vegetation, KEARNEY and HARTER, testing pure solutions of various salts, find⁴⁶ that different species and even different varieties of the same species differ considerably in resistance to the action of magnesium and sodium salts.

⁴³ PRIESTLEY, J. H., and IRVING, ANNIE A., The structure of the chloroplast considered in relation to its function. *Annals of Botany* 21:407-413. *figs.* 2. 1907.

⁴⁴ DUDLEY, ARTHUR H., Floral development and embryogeny in wheat. Report Liverpool Micros. Soc. 1908 1-19. *pls.* 1, 2.

⁴⁵ GUIGNARD, L., Recherches physiologiques sur la greffe des plants à acide cyanhydrique. *Ann. Sci. Nat. Bot.* IX. 6:261-305. *figs.* 9. 1907.

⁴⁶ KEARNEY, T. H., and HARTER, L. L., The comparative tolerance of various plants for the salts common in alkali soils. U. S. Dept. Agric., Bur. Pl. Ind., Bull. 113. pp. 22. 1907.